

degree of latitude. The table shows that the temperature has been decidedly below the mean in New England, the St. Lawrence valley and Minnesota; and above the mean in the Gulf states. The temperature has fallen below freezing at all stations north of a line passing from Shreveport north of Vicksburg, following the 33d parallel. The temperature on the Pacific coast was slightly above the mean, and north of San Diego, averaged 12° higher than the temperature of the corresponding latitude on the Atlantic coast.

*Ranges of Temperature.*—The ranges of temperature has been unusually great in the interior, that of Breckinridge being 87°; Cheyenne, 80°; Dodge City, 84°; Duluth, 76°; Mt. Washington, 77°; North Platte, 76°; Malone, 70°; Omaha, 75°; Pembina, 65°; St. Paul, 80° and Yankton, 80°.

## PRECIPITATION.

Chart No. III shows, in a graphic manner, the precipitation for the month. This has been mostly in the form of rain south of the 42d parallel of latitude. North of this line considerable snow has fallen, particularly in Canada and the northern portion of the Upper Lake region. Regions of large precipitation are shown in Nova Scotia, portions of New England and New Jersey, from the Gulf northward to the lower Ohio valley and on the Pacific coast. The heaviest rains have fallen in the last-named district, amounting to 7.27 inches at San Francisco and 15.75 at Portland, Or., which is very much in excess of the mean for the month. The largest rainfalls east of the Rocky mountains have occurred in the central Mississippi valley, amounting to 7.96 inches at Cairo and 9.36 at Memphis. A large deficiency is noticeable in the Northwest, and at several stations in Kansas no rain or snow fell during the entire month.

*Rainy Days.*—The number of days during the month on which rain or snow fell averages as follows: In New England, the Middle States, the Ohio valley and Tennessee, 12; South Atlantic and Gulf States, 11; Lake region, 14; Northwest, 6.

*Cloudy Days.*—The average number of cloudy days (other than those on which rain or snow fell) is: In New England, 3; Middle Atlantic States, 2; South Atlantic States, 6; Gulf States, Ohio valley and Tennessee, 4; Lake region, 5; Northwest, 7.

## RELATIVE HUMIDITY.

The mean relative humidity for the month ranges between 60 and 70 per cent, in the Northwest and thence southward to northern Texas. At nearly all of the stations elsewhere east of the Rocky mountains the mean for the month ranges between 70 and 80 per cent., except in Florida and on the Gulf coast, where it varies from 79 to 85. At the Rocky mountain stations the figures run from 54 at Santa Fe to 63 at Cheyenne. On the summit of Mt. Washington the mean is 91 and on Pike's Peak 77. This moist atmosphere at these elevated stations is due to their very low temperature.

## WINDS.

The prevailing winds for the month are indicated by the arrows, flying with the wind, on Chart No. II. West and northwest winds have predominated in the Middle States, New England and the Lower Lake region, and northerly winds in Indian Territory, Arkansas, Tennessee and the Ohio valley, central Mississippi and lower Missouri valleys. Southerly winds have prevailed in the Gulf States, but elsewhere variable winds.

The total movements of the air for the month, independent of direction, average as follows in the various districts: New Jersey and New England coasts, 8,740 miles; interior of New England and the Middle States, 4,600; South Atlantic and Gulf coasts,

6,250; interior of Southern States, 3,515; Lake region, 7,100; Ohio valley, 4,750; Northwest, 6,910.

The following are the maximum velocities at several stations: Mt. Washington, November 17th, 8 a. m., 150 miles per hour; 12:22 p. m., 144; 29th, 3:40 p. m., 168 miles per hour; 5 p. m., 156, and 6 p. m., 170; the highest velocity reported from any station of the Signal Service. A velocity of 65 miles per hour occurred at Boston during the storm of the 28th and 29th, which is also the highest velocity reported from that station. A velocity of 54 miles per hour is reported from Indianola during the "norther" of the 29th.

### WATER TEMPERATURES.

The monthly maximum and minimum temperatures of water in the lakes, rivers and on the Gulf and Atlantic coast, from observations taken at the bottom, may be found in the table on Chart No. II. These figures show that the air has been colder than the water at nearly all stations, the only exceptions being Key West, San Francisco, Toledo, Savannah and St. Louis, for which places the mean monthly temperature of the two elements is the same. It is, however, only in the extreme northern sections of the country that a considerable difference is shown, and at most stations in the Southern States and on the Western rivers the water has averaged but two degrees warmer than the air. At the stations in the northern portion of the Upper Lake region, on Lake Champlain and the coast of Maine the water has averaged from seven to thirteen degrees above that of the air.

### NAVIGATION.

On Chart No. III is given the usual table, showing the highest and lowest water-marks, from which it will be seen that the Ohio and the lower Mississippi rivers rose slowly during the latter portion of the month, and that the upper Mississippi and lower Missouri declined and were unusually low at the close of the month.

The following notes, obtained from the reports of the Observers, give the time of the closing of navigation, condition of harbors as regards the ice, and depth of water in rivers: St. Paul, Minn., anchor ice in river 16th and 17th; navigation closed 17th; frozen over 21st. La Crosse, the water was low on the Eau Claire Rapids 8th; floating ice 17th, 18th, 19th and 20th; closed 22d. Dubuque, Iowa, ice in river on the 8th; full of ice 19th and 21st. Davenport, Iowa, floating ice 21st. Rock Island, Ill., the ferry-boat went into winter quarters 27th; river closed 29th. On the 27th the water was lower in the Mississippi river than ever before known. Keokuk, Iowa, ice in river sufficient for skating 21st; floating ice 22d, 24th, 26th, 29th and 30th; navigation closed 27th; not sufficient water for boats to run on the 30th. St. Louis, Mo., floating ice 30th. At Fort Sully and Yankton, D. T., the Missouri river was frozen up the 15th. At Omaha, Neb., there was floating ice 16th, 17th and 19th; river gorged 18th and 20th; frozen over the 24th. Leavenworth, Kan., frozen over the 23d. Plattsmouth, Neb., floating ice 15th and 16th and west channel gorged 17th and 21st. At Breckenridge, Minn., the Red River of the North closed on the 3d. Moorhead, Minn., floating ice on the 1st; frozen over 16th. Pembina, D. T., navigation closed on the 4th. Hennepin, Ill., the Illinois river was closed by ice 24th. Wappinger's Falls, N. Y., the Hudson about closed 30th. South Hartford, N. Y., canal navigation about closed 30th. Brownsville, Penn., creeks frozen over 30th. West Charlotte, Vt., anchor ice in Lake Champlain, 30th. Shelburne, N. H., the Androscoggin was crossed by persons on foot 22d and with horses 27th. Gardiner, Me., the Kennebec river was closed 22d. Alpena, Mich., Thunder Bay river was frozen over 22d and the harbor frozen the 29th. Cleveland, Ohio, ice formed on the canal and river 30th.